

Chapter 6: Marginal Energy Action Price

PMEA and PRBO

- A key component of the Imbalance Pricing process is to determine the price of the Marginal Energy Action;
- A key input to this is the calculation of the Net Imbalance Volume Quantity (QNIV):
 - This key market metric has large influence on the Imbalance Price;
 - Represents the imbalances being resolved through the balancing market.
- QNIV is calculated based on the volumes of actions taken in the balancing market:
 - Sum of all Accepted Offer and Accepted Bid Quantities in the Ranked Set (i.e. excludes orders with volumes below DMAT);
 - If QNIV is negative, there was too much generation vs demand and the TSO had to take more negative “dec” actions to reduce generation than positive “inc” actions to increase generation. In this case the market is said to be “long”;
 - If QNIV is positive, there was too little generation vs demand and the TSO had to take more positive “inc” actions to increase generation than positive “dec” actions to reduce generation. In this case the market is said to be “short”.

PMEA and PRBO

- The Marginal Energy Action Price (PMEA) is the most expensive unflagged action in the ranked set:
 - When QNIV is positive more incs have been taken and the higher the price of the inc the more expensive it is (i.e. the more has to be paid to a unit to increase generation) – PMEA is the highest priced unflagged action;
 - When QNIV is negative more decs have been taken and the lower the price of the dec the more expensive it is (i.e. the less is paid by the unit, or the more is paid to the unit, to reduce generation) – PMEA is the lowest priced unflagged action.
- This enacts the decision that the marginal price is the price of the next MWh up or down which would be used, on the basis that the last MWh used, if it was not at a breakpoint (which it wouldn't be, based on it not having a Non-Marginal Flag) or constrained by system reasons (which it wouldn't be, based on it not having a System Operator Flag) would be the next MWh used;
- The component of the process which follows, NIV Tagging, enacts the decision that it is the price of the action required to meet the NIV:
 - This allows actions with prices which are in-merit but less marginal than that found through PMEA to set the Imbalance Price, but the Replacement Price process ensures that no action with a price which is not in-merit considering PMEA could set the price.

PMEA and PRBO

- All actions which have less economic prices than the Marginal Energy Action Price (PMEA) have their prices replaced by PMEA for the remainder of the process:
 - This ensures that the prices of all actions which were not in merit for setting the marginal price are not considered further in the process;
 - With this, the price cannot be set less economic than PMEA in the NIV and PAR Tagging processes, but can be set by another economic action which was in-merit in the ranked set if it is found to be relevant through NIV or PAR Tagging;
 - This means that the price cannot be set higher than PMEA with when the system is short (QNIV is positive), but the price can be set lower than PMEA;
 - This means that the price cannot be set lower than PMEA when the system is long (QNIV is negative), but the price can be set higher than PMEA.

PMEA and PRBO

- Through the Marginal Energy Action Price and Replacement Price process, it is possible for an action which was in the opposite direction to the NIV to set the Imbalance Price if it was the marginal action:
 - If the QNIV was positive but all Accepted Offers were flagged, the process will select the highest priced Accepted Bid to be the Marginal Energy Action Price;
 - While not intuitive this could be the marginal action, for example:
 - If there was a need for additional generation and the only way to meet it was to turn on a unit, the Minimum Stable Generation of that unit may be too much energy for the additional required, so that unit would be switched on to its MSG and another unit would be turned down to maintain the balance – the unit which was turned down is the marginal action in this scenario.
 - Through setting the Replacement Bid Offer Price of the Accepted Offers with higher prices, PMEA can now set the Imbalance Price even after NIV Tagging determines that an Accepted Offer should set the price.